UNITED STATES PATENT AND TRADEMARK OFFICE

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10/718,138	11/20/2003	Ye-Yi Wang	M61.12-0583	9085

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EXAMINER
SAINT CYR, LEONARD

ART UNIT	PAPER NUMBER
2626	

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04/09/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _21 December 2007_.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-3, 8 - 21_ is/are pending in the application.
     4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) _1-3, 8 - 21_ is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
     a)☐ All   b)☐ Some * c)☐ None of:
       1.☐ Certified copies of the priority documents have been received.
       2.☐ Certified copies of the priority documents have been received in Application No. _____.
       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _11/05/07_.
4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments with respect to claims 1 – 3, 8 - 21 have been considered

but are moot in view of the new ground(s) of rejection.

Applicant argues that Huang et al., do not teach that a backoff model portion

which, when accessed, is configured to assign a backoff score to a word in the

vocabulary, wherein each statistical n-gram model includes a reference to the backoff

model portion for all unseen words.

The examiner agrees, but that limitation is now rejected based on Huang et al.,

(2001). See claim rejections below.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.   Claims 15 – 18 are rejected under 35 U.S.C. 102(b) as being anticipated by

Huang et al., (WO 01/93249).

Regarding claim 15, Huang et al. discloses a composite language model for use

in a speech recognition system, comprising: an automatically learned rules-based

model portion accessed to recognize words in the input speech and to map portions of

an input speech signal to slots derived from a schema; and a statistical model portion

accessed to map portions of the input speech signal to pre-terminals derived from the

schema (page 17, lines 1 – 15; page 23, lines 5- 14).

Regarding claim 16, Huang et al. further disclose that the statistical model portion

comprises: a plurality of statistical n-gram models, one statistical n-gram model

corresponding to each pre-terminal terminal (see page 16, line 25 - page 17, line 5).

Regarding claim 17, Huang et al. further disclose that the rules-based model

portion comprises: a context free grammar (CFG) (see page 3, 28 - page 4, line 5).

Regarding claim 18, Huang et al. further disclose that the composite language

model supports a vocabulary of words (see page 17, lines 5-14),and

wherein the statistical n-gram models are trained based on training

data, (see page 15 lines 5-8),and

wherein words in the vocabulary that are not used to train a specific statistical n-

gram model comprise unseen words for the specific statistical n-gram model (see page

15, lines 5-15).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 1 – 3, 8 – 14, and 19 -21 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Huang et al., (WO 01/93249), in view Huang et al., (Spoken

Language Processing, A Guide to Theory, Algorithm, and System Development;

2001).

Regarding claims 1, 10 -12, Huang et al. discloses a speech processing system,

comprising:

an acoustic model (see page 10, line 19 and fig. 3, element 112);

a composite language model that supports a vocabulary of words and including a rules-

based model portion (see fig. 4, element 144) and a statistical model portion having a

plurality of statistical n-gram models, one statistical n-gram model corresponding to

each pre-terminal (see page 16, line 25 - page 17, line 5); and wherein words in the

vocabulary that are not used to train a specific statistical n-gram model comprise

unseen words for the specific statistical n-gram model (see page 17, lines 28 - page 18

lines 5); and

a decoder coupled to the acoustic model and the composite language model and

configured to map portions of a natural language speech input to pre- terminals and

slots, derived from a schema, based on the acoustic model and the composite language

model (see page 23, lines 5-14).

Huang et al., (249) do not specifically teach that the statistical model portion of

the composite language model further comprises: a backoff model portion which, when

accessed, is configured to assign a backoff score to a word in the vocabulary, wherein

each statistical n-gram model includes a reference to the backoff model portion for all

unseen words.

Huang et al., (2001) teach obtaining probabilities for unseen bigrams through

Katz's backoff mechanism. That is, for unseen bigram

$$P(w_j \mid w_i),$$

$$P(w_j \mid w_i) = \alpha(w_i)P(w_j)$$

where $\alpha(w_i)$ is the backoff weight for word w_i. (page 618, section 12.3 3.1).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to backoff model as taught by Huang (2001) in Huang

(249), because that would better obtain the n-gram model, by only connecting observed

bigrams by direct word transitions with correspondent bigram probabilities (page 619,

lines 1 – 5).

Regarding claim 2, Huang et al. (249) further disclose that the decoder is

configured to map portions of the natural language speech input to the slots based on

the rules-based model portion of the composite language model (see page 23, lines 5-

14).

Regarding claim 3, Huang et al. (249) further disclose that the decoder is

configured to map portions of the natural language speech input to the pre-terminals

based on the statistical model portion of the composite language model (see page 23,

lines 5-14).

Regarding claim 13, Huang et al. (2001) further disclose that a separate backoff

model comprises: referring to a uniform distribution n-gram (page 618, section 12.3 3.1).

Regarding claims 8, and 14, Huang et al. (2001) further disclose that the backoff

model n-gram assigns a uniform score to every word in the vocabulary (page 618,

section 12.3 3.1).

Regarding claim 9, Huang et al. (249) further disclose a context free grammar

(CFG) (see page 3, 28 - page 4, line 5).

As per claims 19, and 20, Huang et al., (249) do not specifically teach that the

statistical model portion of the composite language model further comprises:a backoff

model portion which, when accessed, is configured to assign a backoff score to a word

in the vocabulary, wherein each statistical n-gram model includes a reference to the

backoff model portion for all unseen words.

Huang et al., (2001) teach obtaining probabilities for unseen bigrams through

Katz's backoff mechanism. That is, for unseen bigram

$$P(w_j \mid w_i),$$

$$P(w_j \mid w_i) = \alpha(w_i)P(w_j)$$

where $\alpha(w_i)$ is the backoff weight for word w_i. (page 618, section 12.3 3.1).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to backoff model as taught by Huang (2001) in Huang

(249), because that would better obtain the n-gram model, by only connecting observed

bigrams by direct word transitions with correspondent bigram probabilities (page 619,

lines 1 – 5).

Regarding claim 21, Huang et al. (2001) further disclose that the backoff model

n-gram assigns a uniform score to every word in the vocabulary (page 618, section 12.3

3.1).

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to LEONARD SAINT CYR whose telephone number is

(571) 272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone

number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

03/22/08

/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626